

## **Problem No. 1: The Blocks Problem**

### **Pseudo code:**

1. read n from input.
2. initialize blocks array of size 25x25 with each row representing a block slot and the first element of each row representing the number of blocks in the slot.
3. loop until command is "quit":
  - a. read command from input.
  - b. extract command type, movement type, and block numbers a and b.
  - c. use 'find' function to get the location of a and b in the blocks array.
  - d. if command is illegal (a = b or a and b are in the same stack of blocks), ignore the command and move on to the next command
  - e. perform required action based on command type:
    - i. for "move" type, call "returnblocks" function to move all blocks above a to their initial positions.
    - ii. for "onto" type, call "returnblocks" function to move all blocks above b to their initial positions.
    - iii. for "pile" command, move pile of blocks a and above it while retaining the order of the blocks above a
    - iv. for "over" command, leave blocks stacked on top of b as they are and place block/pile a on top.
    - v. for "pile" command, leave blocks stacked on top of a as they are and move the whole pile.
  - f. update blocks array by moving blocks to their new positions based on command type and update the number of blocks in slots.
4. 'find' function:
  - a. take block number i and variables a and b as input.
  - b. search blocks array to find location of block i
  - c. scan each row of the blocks array to find the first occurrence of block i
  - d. set value of a to the row (slot) number and b to the column (floor) number where block i is located.
  - e. return
5. 'returnblocks' function:
  - a. take location variables a and b as input.
  - b. move all blocks stacked on top of block at position a starting from position b back to their initial positions.
  - c. for each block, set its row to the block's original position (i.e., the slot corresponding to the block's number) and set the number of blocks stacked on that row to 1.
  - d. set first element of row to block number
  - e. update number of blocks stacked on block a to be the position before the first block that was moved.